Elementary Quantitative Data Analysis - Analysis of Revenue Trend and Sales Volume of a Local Multipurpose Store

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Contents

1 Executive Summary

The Business Data Management Capstone Project is a project submitted as a part of the curriculum of BS in Data Science and Application at IIT Madras. The project aims to develop an optimal solution to a business problem using data analysis techniques. The data used in this project has been collected from a local multipurpose store named 'Nandi Gift House'.

The received data was cleansed and formatted for analysis. The objective behind the analysis is to find opportunities to improve revenue generation by extracting meaningful insights.

2 Business Problem

- Perform a general analysis of the sales and revenue data to find areas of improvement.
- Analyze the revenue trend and suggest investments to boost revenue.
- Identify new product introduction opportunities based on category performance.

3 Process and Methodology

3.1 Data Collection and Processing

- Raw data was collected in spreadsheets.
- Data was cleansed and organized into different categories.
- Factors like sales volume and revenue were analyzed using Excel tools.

Link: Sales and Revenue Dataset

3.2 Analysis Tools

- MS Excel and Google Sheets were used for analysis.
- Graphs, pivot tables, and trend curves were applied to study the data.
- Inferences were made based on pictorial representations and tabulated data.

3.3 SKU Dictionary

Item Name	SKU	Item Name	SKU
Drinking Water Bottles	BE01	Face Cream	COSM03
Drinking Soda	BE02	Black Ink Pen	WMP01
Soft Drink (Glass Bottle)	BE03	Blue Ink Pen	WMP02
Soft Drink (1L plastic bottle)	BE04	Blank Long Notebook	WMNT01
Soft Drink (500 ml plastic bottle)	BE05	Lined Long Notebook	WMNT02
Bourbon	BI01	Lined Short Notebook	WMNT03
Marie Biscuits	BI02	Blank Short Notebook	WMNT04
Biskfarm Cookies	BI03	Cover File	WMF01
Haldiram Bhujia	SN01	Envelope File	WMF02
Bapuji Cake	SN02	Large Envelope File	WMF03
Chips	SN03	Lead Pencils (Set of 3)	WMPE01
Pack of bread	SN04	Graphite Pencils (Set of 6)	WMPE02
Body Lotion	COSM01	Color Pencils Set	WMPE03
Deodorants	COSM02	Apsara Eraser Set	WME01

Figure 1: SKU Dictionary

4 Results and Findings

4.1 Sales Pareto Analysis

The highest-selling products within this time interval were SN03 (9502), SN01 (8048), WMPE02 (6961), and WMPE01 (6629).

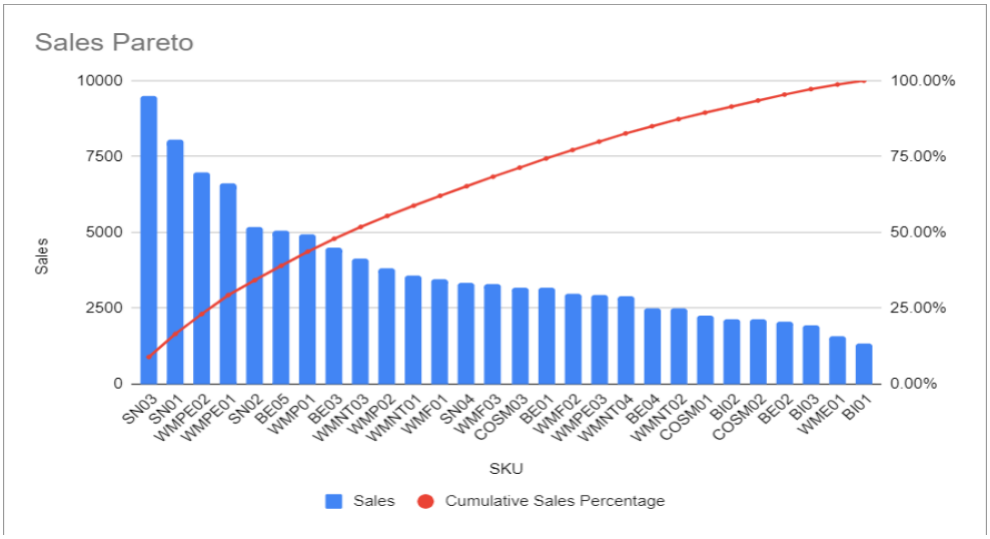


Figure 2: Sales-Pareto

4.2 Revenue Pareto Analysis

Leading revenue generators were COSM02, BE03, and SN01.

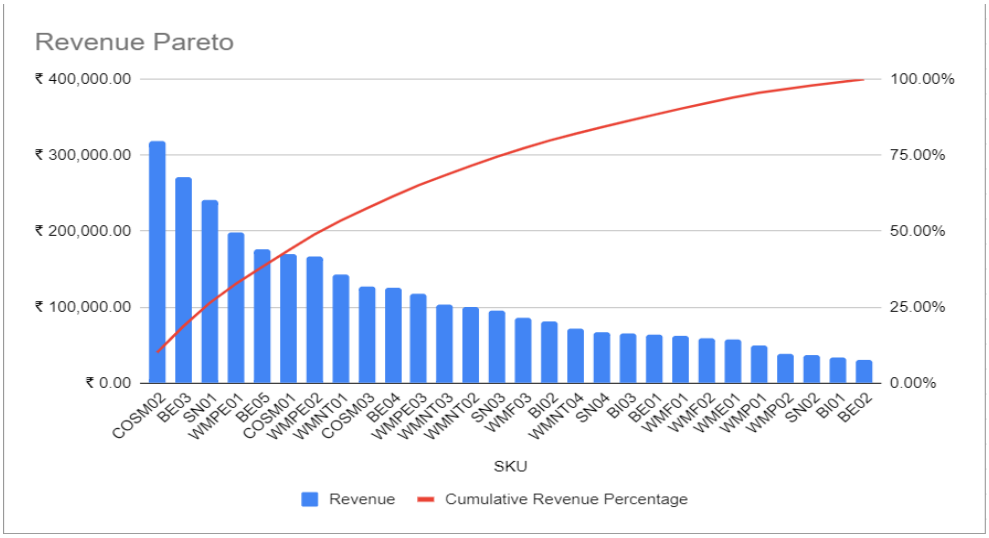


Figure 3: Revenue-Pareto

4.3 Daily Sales and Revenue Trends

Significant drops in sales and revenue were observed during Durga Puja and Kali Puja due to store closures.

Figure 4: Daily-Sales

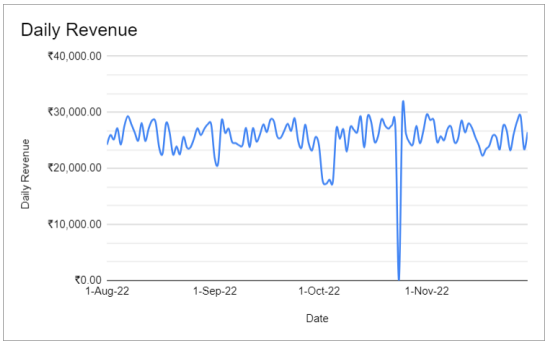


Figure 5: Daily-Revenue

Figure 6: Trendlines

4.4 Revenue by Business Unit

- Beverages contributed the highest revenue (21.4%).
- Cosmetics (18.6%) and pencils (15.5%) followed.
- Erasers contributed the least revenue.

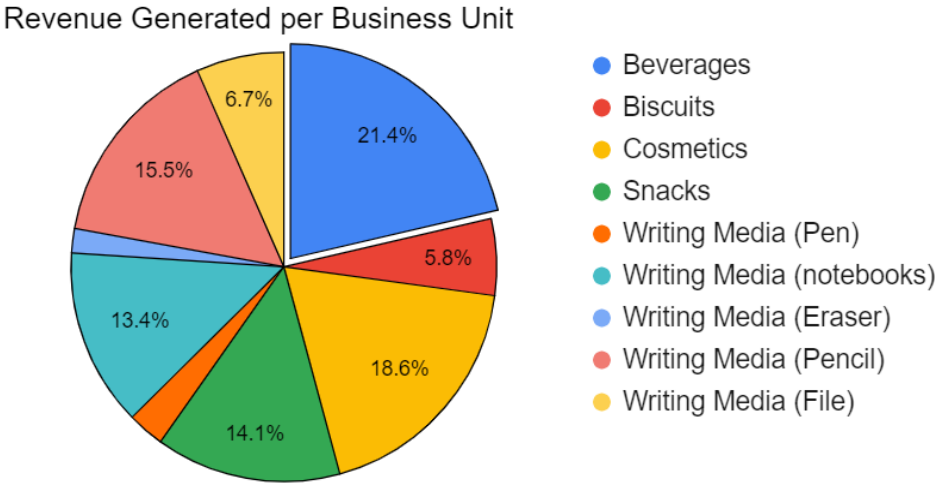
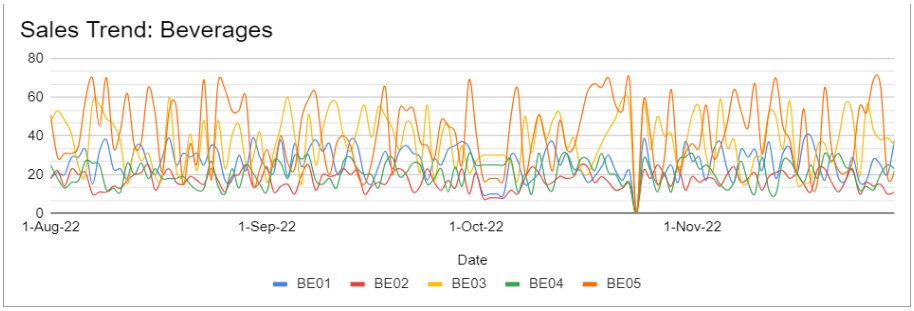


Figure 7: Revenue distribution percentage

5 Inferences from Sales Trends

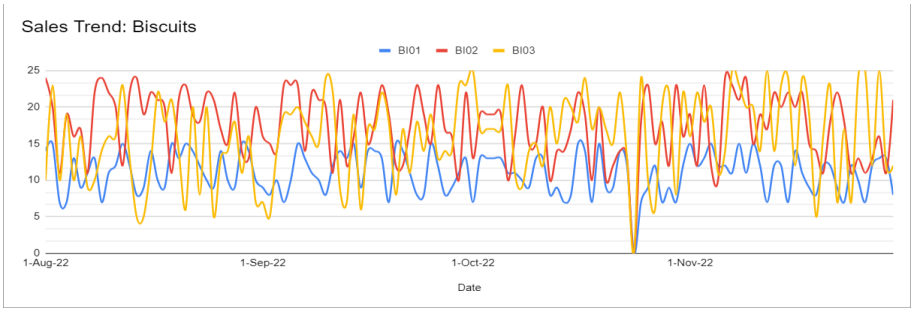
5.1 Beverages

BE05 was the highest-selling beverage, while BE02 had the lowest sales. It is suggested to replace BE02 with a variant of BE05.



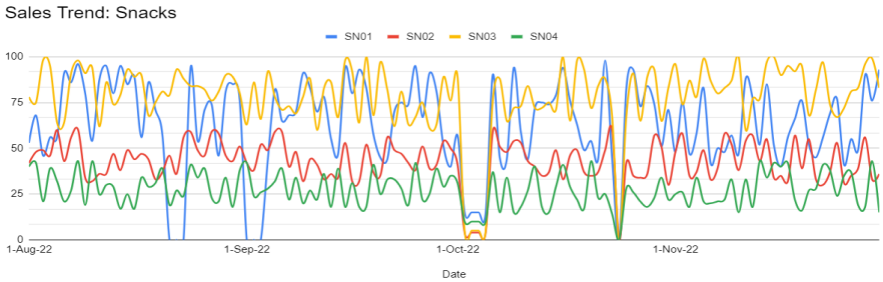
5.2 Biscuits

BI02 had the highest sales. BI03 showed oscillating sales trends, indicating its recent introduction in the market.



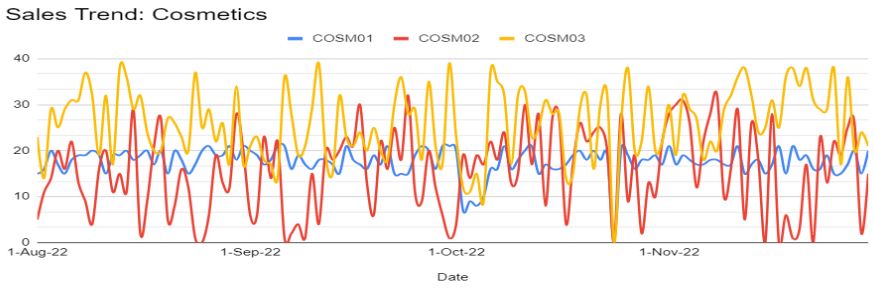
5.3 Snacks

SN03 was the highest-selling snack. SN01 had fluctuating sales due to transportation issues.



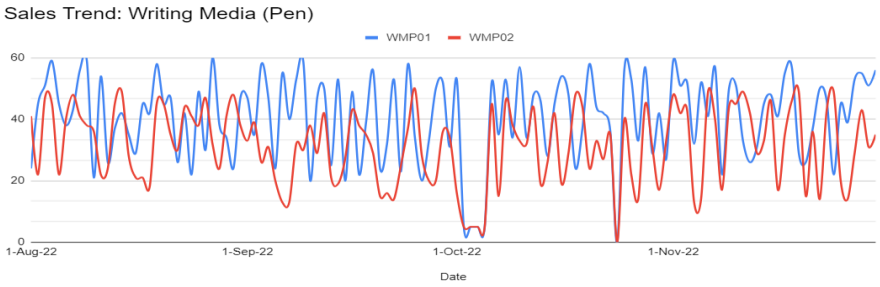
5.4 Cosmetics

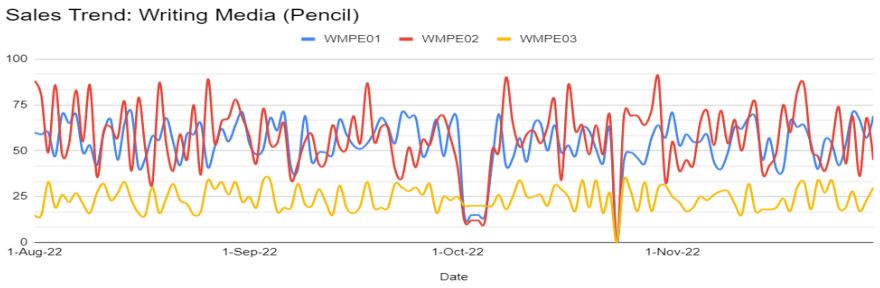
COSM03 had the highest sales, while COSM02 showed consistently low sales. It is recommended to replace COSM02 with a variant of COSM01 or COSM03.

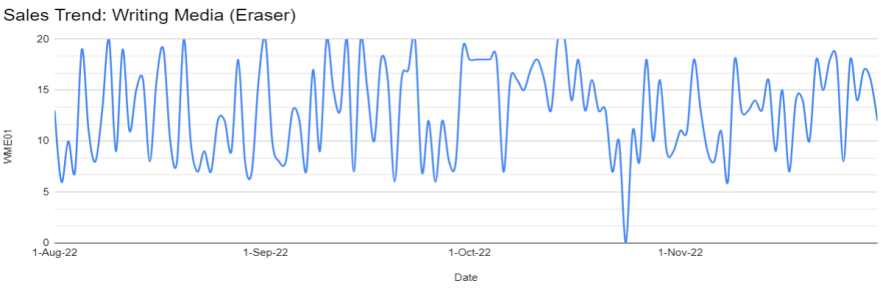


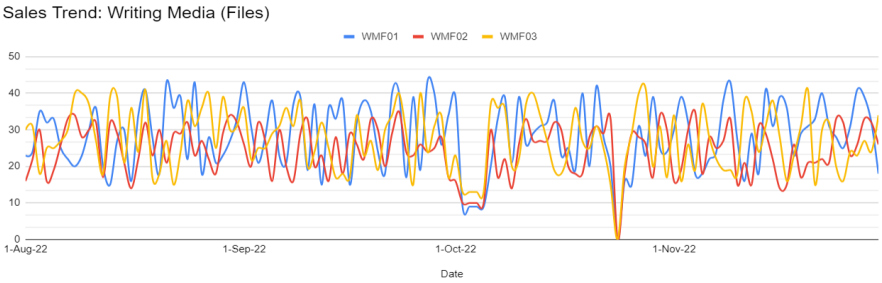
5.5 Writing Media: Pens, Pencils, and Erasers

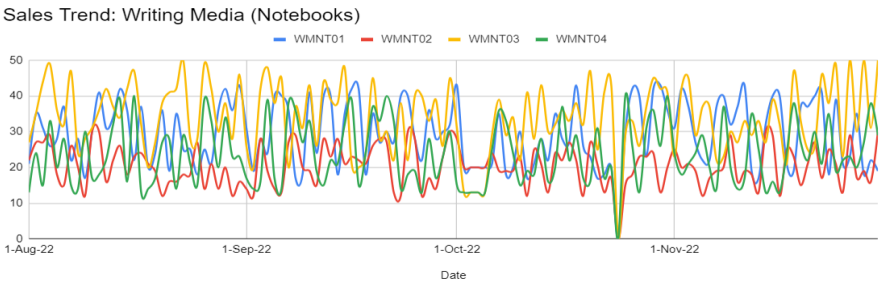
- WMPE02 was the highest-selling pencil, followed by WMPE01. WMPE03 had the lowest sales and is suggested for replacement.
- Only one eraser variant was available, contributing the least revenue. It is recommended to replace WME01 with a new product.











6 Conclusion

This project successfully analyzed the revenue trends and sales performance of a local multipurpose store, providing meaningful insights that can be leveraged for business optimization. Through a structured data analysis process, we identified high-performing product categories such as beverages and cosmetics and highlighted underperforming items that should be reconsidered for inventory adjustments. The study revealed key patterns in daily sales and revenue trends, emphasizing the impact of external factors such as seasonal shopping behavior and festival periods.

One of the most critical insights from this analysis is the Pareto principle at play, where a small subset of products contributes to the majority of sales and revenue. By focusing on these key contributors and introducing new product variations based on consumer preferences, the store can enhance its overall profitability. The results also suggest that strategic marketing efforts, such as promotional campaigns and targeted stock replenishments, can help mitigate revenue fluctuations.

6.1 Future Scopes

Going forward, advanced machine learning techniques can be employed to build predictive models for sales forecasting, enabling proactive decision-making. Further analysis incorporating customer segmentation and market trends can refine product placement strategies, ultimately leading to increased consumer satisfaction and higher revenue.

Overall, this capstone project demonstrates how data-driven approaches can significantly enhance business decision-making. The recommendations outlined in this report provide actionable steps for improving sales efficiency and revenue optimization, ensuring sustained growth for the business.